

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604**

June 30, 2015

Mr. William Brewer, Ph.D.
Site Manager
Granville Solvents Site
WBESCNC@aol.com

Re: Post-Removal Action Completion (RAC) Report, Granville Solvents Inc. Site, Village of Granville, Licking County, Ohio

Dear Mr. Brewer,

The U.S. Environmental Protection Agency (EPA) has reviewed the Post Removal Action Completion (RAC) Report of October 5, 2012 ("RAC Report") submitted for the Granville Solvents Site by the Granville Solvents Site Response Management Group ("Group"). The Report is required under the September 7, 1994 Administrative Order on Consent, Docket No. V-W-94-C-248 (the "AOC") between the Group and EPA.

The RAC Report contains the results of the implementation of the Post-RAC Work Plan dated February 29, 2012 for the site that was prepared in response to EPA's review comments of April 6, 2011 and a meeting on June 29, 2011 regarding the previous Draft RAC Report of July 30, 2010. EPA approved the Post-RAC Work Plan on April 12, 2012¹. During the 2011 meeting, EPA requested that the following tasks be completed at the site:

1. Perform vertical aquifer sampling from the top to the bottom of the aquifer at a location halfway between the MW-07 and MW-08 clusters.
2. Collect groundwater levels on a 20-minute frequency in several monitoring wells to determine if trends in water levels can be attributed to the start or termination of pumping from the municipal wells, and which pumping wells it can be related to.
3. Collect a (groundwater) sample from GSSEW-1.
4. Continue annual (groundwater) monitoring for a minimum of two years (semi-annually through 2012), and until it is determined that monitoring is no longer necessary.

¹ The RAC Report was submitted to the EPA in order to apply for a Notice of Completion (NOC) regarding removal actions conducted at the site between 1995 and 2005.

The overall objective of the work plan was to define the proposed scope of work to address Tasks (1) and (2) and to propose a scope of work to address other concerns at the Site. The other concerns consist of the discrepancy between groundwater flow direction and volatile organic compound (VOC) plume migration direction, potential presence of 1,4-dioxane and occurrence of natural attenuation processes.

The activities conducted during implementation of this work plan include the following:

- May 2012 Semi-Annual Groundwater Sampling
- Vertical Groundwater Profiling
- Pump Response Testing
- South Area Sampling
- Attenuation Sampling
- Testing for 1,4-dioxane

EPA requested that semi-annual groundwater sampling continue through calendar year 2012. The RAC Report, as well as the 2012 Annual Groundwater Monitoring Report of February 28, 2013 contains results of the May 2012 semi-annual sampling event.

Because the previous USGS hydrogeologist (Bob Kay) assigned to the site is no longer at EPA Region 5, I consulted his successor, Amy Gahala. As Amy is unfamiliar with this site, she performed a comprehensive review of the site documents since 2010, leading up to the Draft RAC reports and annual groundwater monitoring reports. This was necessary in order for her to answer some questions I had that could affect our ability to close out the site. Our comments on the RAC Report follow below.

Page 1, Section 2.1 (Maintenance and Repairs)

The second and third paragraphs indicate that 10 wells needed to be altered and that in May 2012, the dedicated sampling pumps and tubing at each of the semi-annual monitoring wells was removed and the top of each well casing was replaced with a standard water-tight cap. This was documented in the May 8, 2012 "Change Notification" letter that AECOM, on behalf of the Group, submitted to EPA. The last sentence in Paragraph 2 of Section 2.1 indicates that this letter is included in Appendix B of the RAC Report.

This appears to be a mistake, since the referenced Change Notification letter is actually found in Appendix A of the document. There does not appear to be an Appendix B. Further, the May 8, 2012 letter lists 10 wells, including GSSEW-01; however, this well does not appear in the wells listed on Page 2 of the RAC Report and there are no May 2012 sampling results for this well in Table 3 of the RAC Report.

Pages 4-5, Section 3.0 (Vertical Profile Groundwater Sampling)

This section would have benefited from a figure or the inclusion of a cross-section. In Section 3.1 (Methods), which describes the attempts to achieve the groundwater sampling target depths, it is not clear how far they pushed the apparatus, not what was actually sampled. The methods

may have also affected the integrity of the sampling results. The results still indicate, however, that the main portion of the plume is shallow (less than 35 feet in depth).

Pages 5-6, Section 4.0 (Pump Response Test)

After reviewing the pump test results provided in the graph in Appendix F of the RAC Report, we noted some inconsistencies regarding the water elevation levels observed during the pump tests. The wells PW-4 and PW-2 did not appear to be pumping at their maximum rates. The water elevation in PW-4 during pumping was 896.8 feet, whereas at other times, the groundwater elevation during pumping (i.e., as indicated in Figure 7 on May 5, 2012) was recorded to be below 870 feet elevation. This represents more than a 25-foot difference in drawdown. Well PW-2, which is closer to the plume, recorded a drawdown during pumping of only 0.8 feet. This seems implausible, considering PW-2 was *supposedly* pumping at a rate of 861 gallons-per-minute (gpm) all day Sunday (June 10th) through Tuesday (see Page 5 of RAC Report). Well PW-4 was then turned on at 5 PM on Tuesday and ran at an average pump rate of 667 gpm constantly through Friday.

We question why there is so much of a difference in drawdown (groundwater elevation) during one period of groundwater elevation monitoring (May 5, 2012) versus another planned period with monitoring wells equipped with transducers. During other synoptic measurements for the Annual Monitoring Reports, well PW-2 had an elevation level of 880.10 feet while it was pumping (see Table 1 of the February 2014 Annual Report). Therefore, how is it possible for both PW-4 and PW-2 to have the respective groundwater elevations of 896.8 feet and 895.6 feet during the pumping test observations? This information needs to be reviewed and further explained.

Page 8, Section 8 (Conclusions)

We have provided some general thoughts regarding the conclusions stated in this section. The first is regarding the groundwater conceptual model.

Raccoon Creek is the primary influence on the groundwater hydraulics and flow paths. This is evident in the mixture of upwards and downwards vertical gradients in the nested wells. It also makes the flow paths less predictable and groundwater contours are relatively useless. It is especially important in these cases to monitor the contaminants as a means for determining groundwater flow paths. In addition to the creek, the village water supply pumping, particularly at PW-2, influences the direction of the groundwater flow.

Previous reports claim that a groundwater divide existed between GSMW-06 and GSSMW-15. The fact that GSSMW-15 contains contaminants that are stable or increasing does not support the presence of a groundwater divide in this area. MW-08 has also shown stable detections of cis-1,2-dichloroethylene (DCE), and is located just northwest of GSSMW-15. Thus, no groundwater divide exists.

The only contaminants detected away from the plume and towards the production wells are daughter products of the source contaminants. This may be indicating that while there is a

component of flow in the northwest direction toward the well field, it is not enough to draw any source from that area. GSSMW-15 is also showing a slight increase in tetrachloroethylene (PCE) and a steady increase in the daughter products trichloroethylene (TCE), trichloroethane (TCA), and cis- and trans-1,2-DCE following the shutdown of the system in 2005. The plume may be somewhat influenced by the pumping from the municipal well field. The PCE concentrations have doubled since the shutdown (with sporadic high hits in between—6.1 to 13 ug/l), and the concentration of TCE has nearly tripled (25 to 61 ug/l) since the shutdown. The concentrations of the daughter products have also doubled at a minimum. From a temporal perspective, it took nearly 10 years for the plume to shift in the well field direction. It may take another 10 years before these contaminants reach MW-08. This is because the groundwater gradients are relatively flat and the groundwater flow paths are continuously being pulled in several directions based on the creek elevation, well field pumping, and seasonal effects.

There is the potential for the plume to reach the village wells; however, it may take a significantly long time. The data shows a shift of the plume from MW-2D to GSSMW-15 (200 feet) has occurred in the last 10 years. It is approximately 800 feet to the radius of influence for PW-2. This means that the plume will reach this area in approximately 40 years. The plume shift is also validated by the concentrations in MW-P1 and MW-02D. Contaminant concentrations in the source area have been stable and do not appear to be decreasing. The presence of daughter products indicate that degradation is occurring, but is expected to continue at a very slow rate from this point on. The rate of degradation and plume reduction since the 2005 shutdown needs to be closely examined before EPA can approve of any monitoring changes or site closure. Previous reports show that the plume size decreased in the past, but the size now appears to be static and is very slowly shifting to the northwest.

The plume stability should be assessed to determine or project the contaminant concentrations 40 years into the future based on the trends seen since the 2005 shutdown. After the plume stability is assessed, we will know more about whether the site is ready for closure.

We will be happy to discuss these comments in more detail during a conference call or visit, and to work with you to determine the necessary information to support site closure. If you have any questions or concerns regarding this letter, please contact me.

Sincerely,



Sheila A. Sullivan
Remedial Project Manager
Superfund Division
U.S. EPA, Region 5
Tel: (312) 886-5251
Email: Sullivan.sheila@epa.gov

cc: Ron Roelker, AECOM (w/electronic att.)
Fred Meyers, Ohio EPA (w/electronic att.)
Dan Leavell, Granville Source Water Protection Committee (w/electronic att.)